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W. T. CLARK

1,907,740

RENEWABLE LINK CARTRIDGE FUSE

Filed Feb. 21, 1930

Fig. 1.

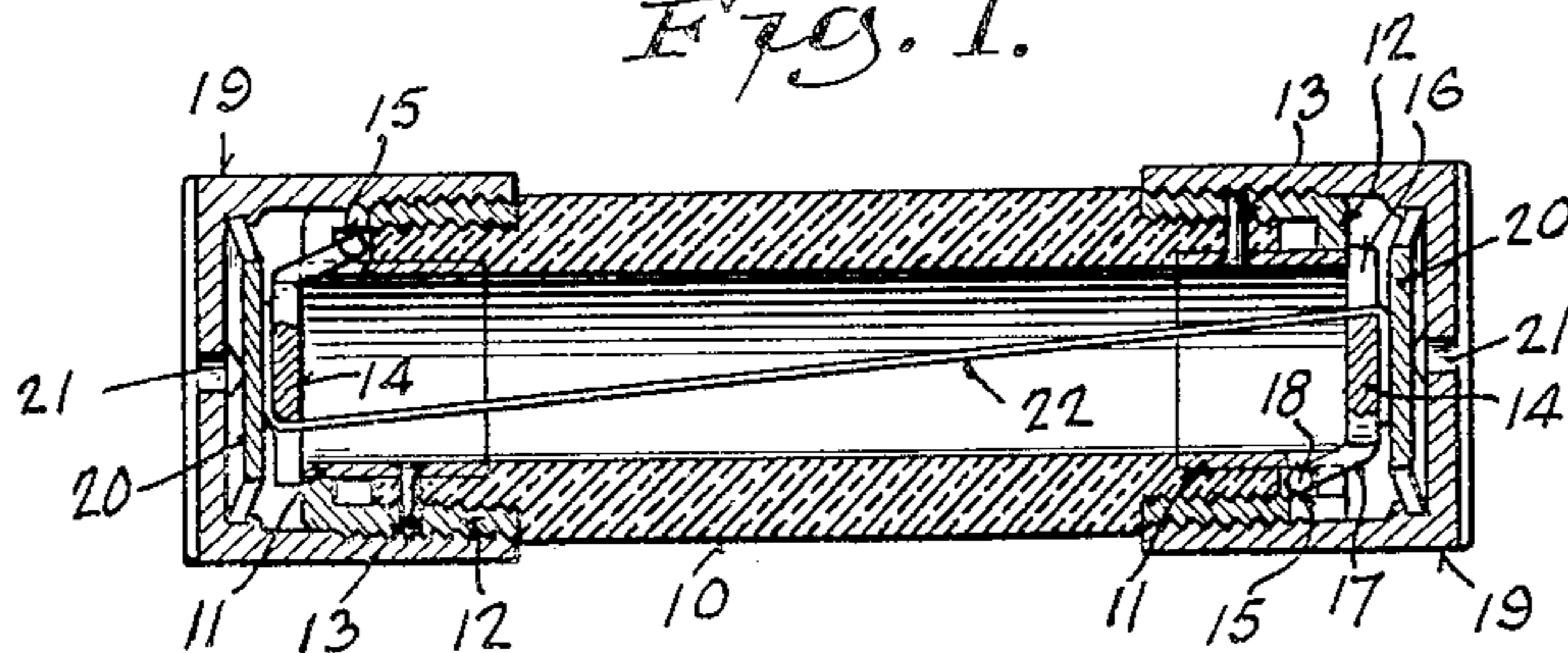


Fig. 2.

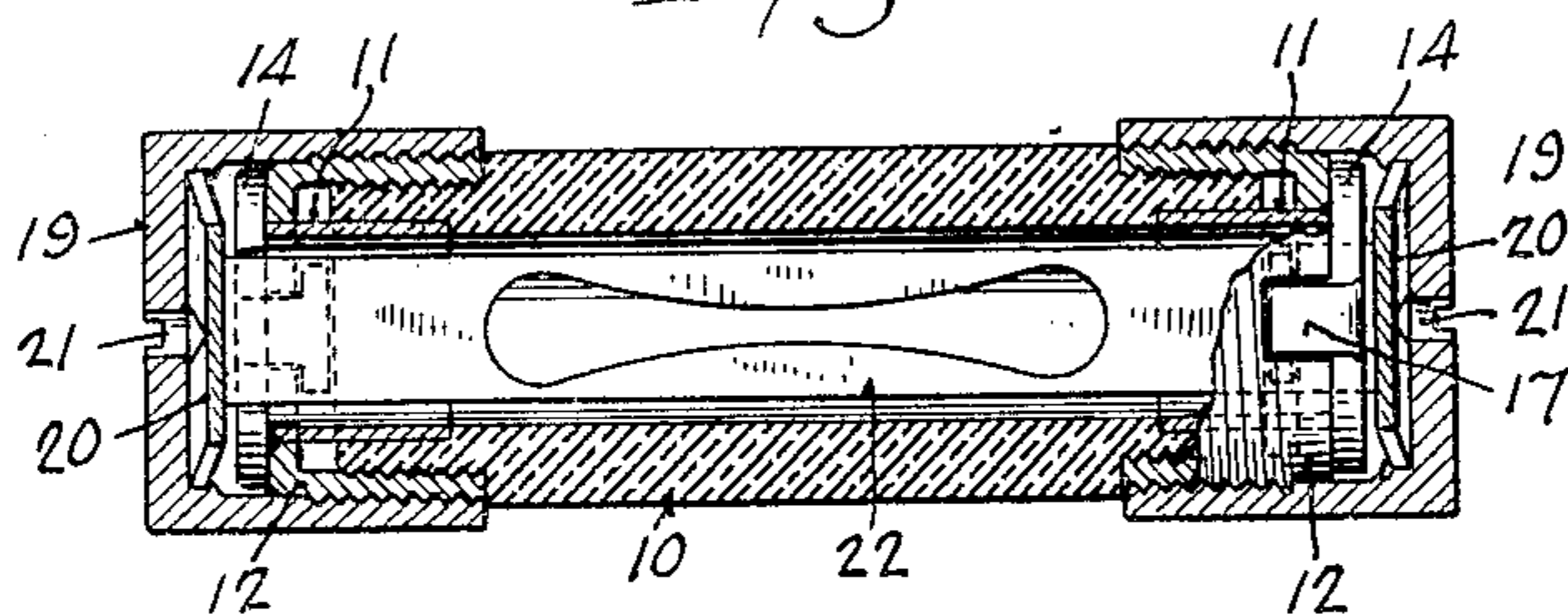


Fig. 3.

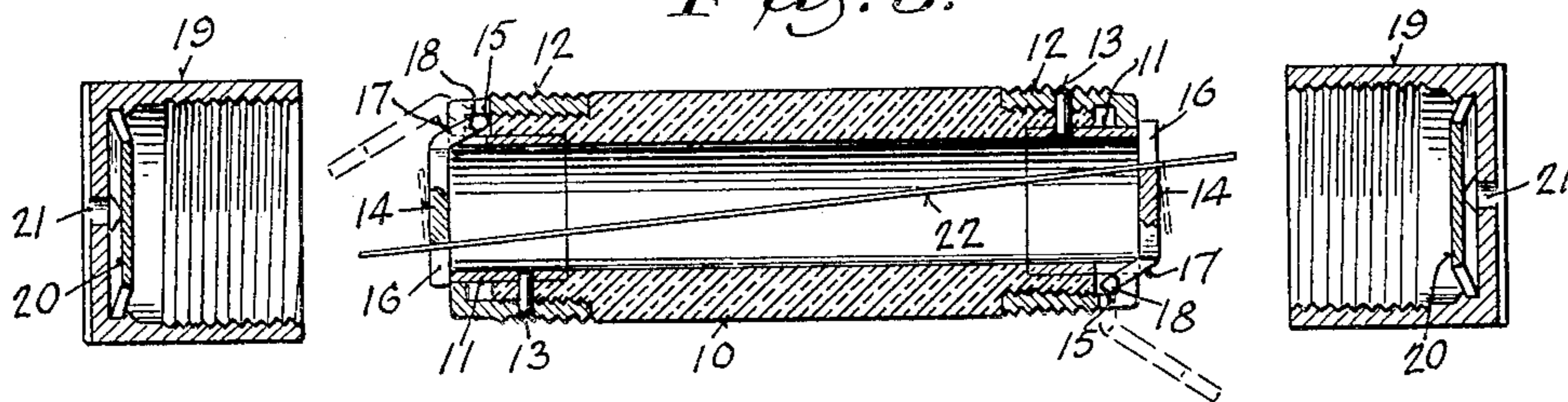


Fig. 4.

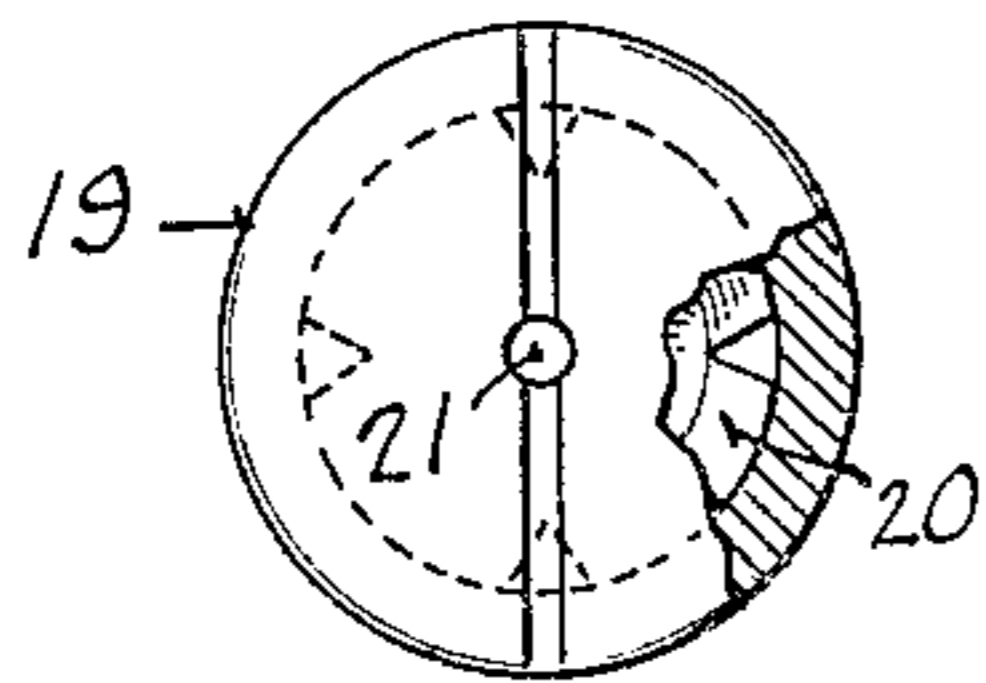


Fig. 5.

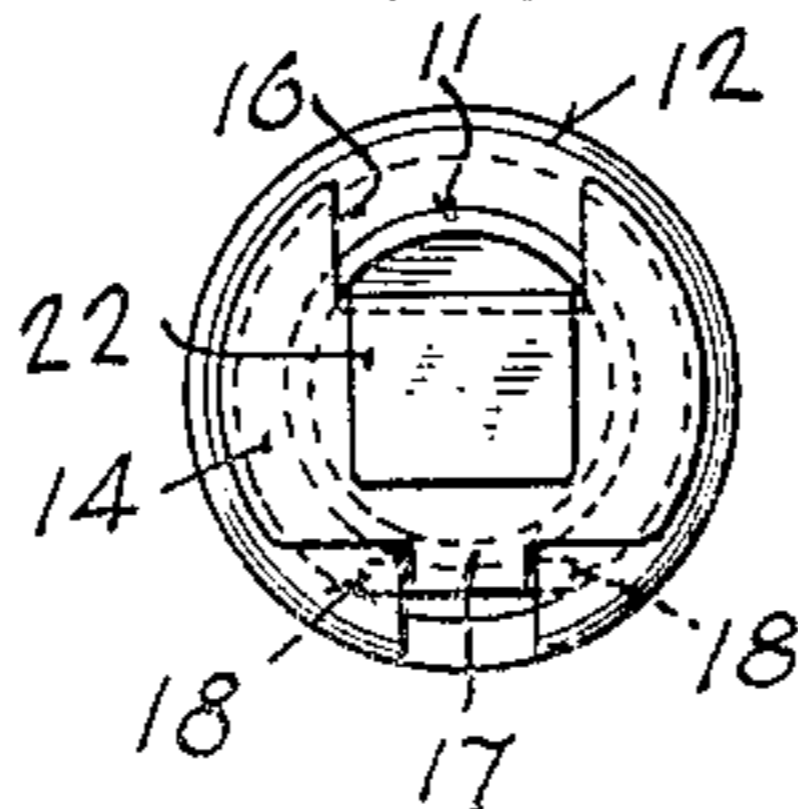
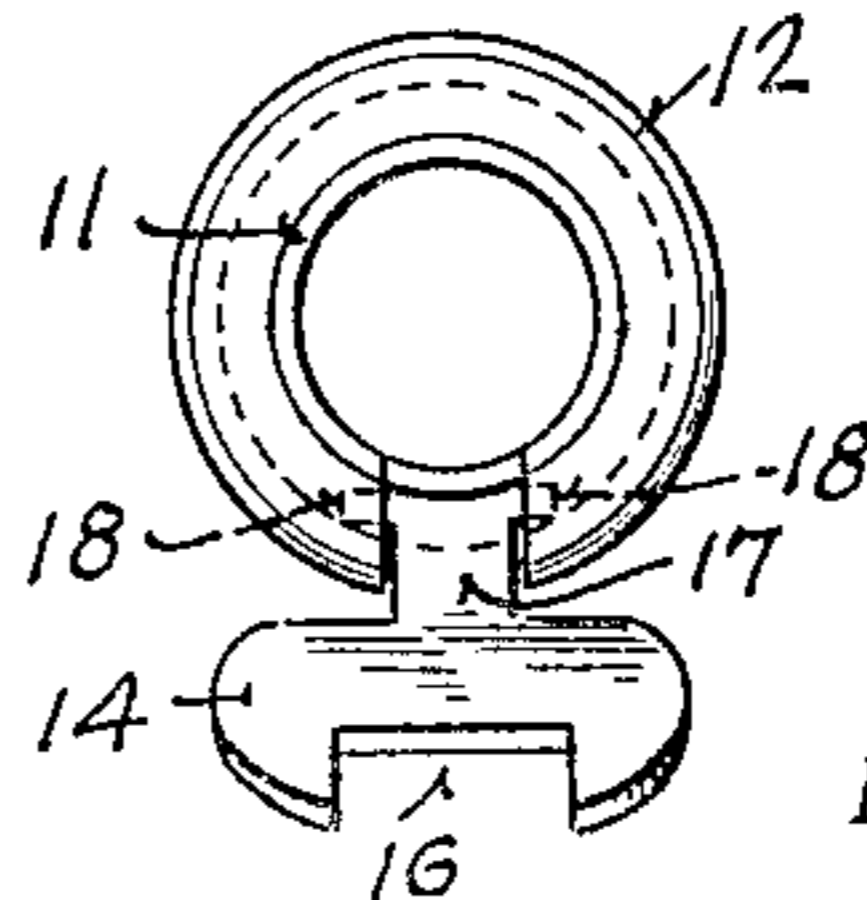


Fig. 6.



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UNITED STATES PATENT OFFICE

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RENEWABLE LINK CARTRIDGE FUSE

Application filed February 21, 1930. Serial No. 430,307.

My present invention relates to renewable link fuses of the cartridge type, comprising an insulating tubular casing having ferrules at its ends through which electrical connection is made.

The invention resides in an improvement in the construction and arrangement of the means employed for maintaining the ends of the fusible link disposed within the casing in an electrical contact with the terminals of the fuse, of which latter the ferrules are a part.

The invention involves the particular arrangement of a plate pivoted one at each end of the casing and adapted to partially cover and overlap the same and upon the outer side of which cover plate the end of the fusible link is adapted to be folded and pressed into contact. The invention also involves the form and mounting of such pivoted cover plate, whereby the construction and assembly are greatly simplified and rendered more economical in production.

The invention also applies to a yielding pressure element, arranged interiorly at the end of the ferrule, and which is adapted to bear upon the bent end of the fusible link, when the ferrule is screwed upon the casing, to maintain the link in contact with the cover plate.

The invention further involves the specific construction and arrangement of certain other parts at the end of the casing.

The foregoing and other features of the invention will now be specifically described, and the novelty residing therein pointed out in the appended claims.

In the accompanying drawing:

Figure 1 is a longitudinal central sectional view through a cartridge fuse constructed in accordance with my invention, the fusible link being shown in edgewise elevation.

Fig. 2 is a like view of the fuse, looking in a plane perpendicular to the plane of Fig. 1, as from the lower side of Fig. 1, and showing the fusible link in side elevation.

Fig. 3 is a view similar to Fig. 1, with the parts in separated positions.

Fig. 4 is a view in elevation of the outer

end of one of the ferrules, partly broken out to show the configuration of the yielding pressure element, before referred to.

Fig. 5 is an end view of Fig. 1, looking from the right, with the ferrule removed, showing the pivoted cover plate with one end of the fusible link bent over and engaged therewith; and

Fig. 6 is a view similar to Fig. 5, with the cover plate in its opened position.

In the accompanying drawing the numeral 10 indicates a tubular casing of indurated fibre or other insulating material. The ends of the casing are counterbored for the reception of liners in the form of thin metal sleeves 11, which have a close fit in the counterbores, and project a short distance outwardly of the ends of the casing. The ends of the casing 10 are reduced circumferentially for a portion of the length of the casing, and circular shoulders are provided at the inner ends of the reduced portions. Caps 12, the side walls of which are threaded interiorly and exteriorly, and having a large central perforation in the bottom or ends thereof to provide an inwardly extending overhanging flange, are threaded on to the reduced ends of the casing, the rim of the cap abutting the circular shoulder on the casing. The flange of the cap is axially spaced from the end of the casing so as to create an annular space, the latter being defined by the end of the casing, the wall and flange of the cap, and the liner 11. A pin 13 is passed radially through the wall of the cap, the reduced end of the casing, and the liner 11, to hold the parts 11 and 12 in a position of assembly upon the end of the casing and prevent their disarrangement.

The projecting end of the liner 11 is provided at one point in its diameter with a radial notch, and the flange of the cap with a corresponding notch, the notches being in register when the parts are assembled and fixed in position by the pin 13.

The open end of the casing is partially closed by a substantially circular pivoted plate 14, hinged to the end of the casing, as at 15, and having a cut out portion 16 opposite the hinge. The hinge portion integral

with the cover plate is embodied in a radially projecting tongue 17 having opposite lateral extensions 18. The extensions 18 enter the confined annular space before referred to, and form journals for the rotation of the hinge. The width of the tongue 17 is slightly less than the width of the aligned notches in the sleeve 11 and cap 12, so as to provide free movement of the hinge in closing and opening the cover plate 14. The notch in the opposite edge of the pivoted cover plate 14, has a width which will enable it to receive therein, one end of a fusible link of flat sheet metal of high resistance, the bottom margin of the notch being formed as a straight edge, and extending the full width of the notch. It will be observed that the axial opening in the cap is enlarged, this being for the purpose of facilitating the loading of the casings with fusible elements of the cylindrical powder pack type, as well as the bare link type.

The tongue 17 is bent from the plane of the pivoted cover plate, so that the projecting journals of the end lie in a plane separated some distance from the plane of the cover plate. This construction enables a very convenient arrangement of the operating parts to be made.

The cup-like ferrules 19 are threaded interiorly for engagement with the threaded exterior surfaces of the caps 12 of the casing. In each ferrule, I place a yielding pressure element 20, formed as a slightly dished disc from resilient sheet metal, and provided with a plurality of notches in its periphery. The yielding pressure element 20 may be secured in longitudinally fixed relation to the ferrule 19 by spreading the metal of the ferrule over the margin of the disc 20 at a plurality of points, so that the disc 20 may be permanently retained in position in the ferrule. The notches at the margin of the disc-like yielding pressure element 20, permit the ready escape from the casing of the gases generated when the fuse is blown, such gases passing from the casing through the central perforations 21 in the ferrules. The dished portions of the discs intermediate the notches in the margin provide for the necessary yielding pressure when the ferrules are turned up to make a contact.

The fusible link 22 shown is of a special construction invented by me, and is set forth and claimed in a companion application filed February 21, 1930, Serial No. 430,309, no claim herein being made to the said link.

In assembling the cartridge, the fusible link 22, is passed through the tubular casing and made to project evenly at the ends thereof, and the pivoted cover plates folded against the end of the casing. The projecting ends of the link 22, shown in full lines in Fig. 3, are then bent over the straight edge at the bottom of the notch 16 in the piv-

oted cover plate, and made to lie parallel with the surface of the said plate, as shown by dotted lines in Fig. 3. The ferrules 19 are then screwed on to the caps 12 of the casing, until the yielding pressure discs 20 are in engagement with the bent ends of the fusible link. The resulting pressure in clamping the bent ends of the fusible link between the flat surface of the pivoted cover plates 14 and the resilient discs 20, insures a thorough electrical contact, which latter is secured without distortion of the fusible link 22 in turning up the ferrules.

The pivoting of the plates at opposite points in the diameter, as shown in Fig. 3, is preferred, inasmuch as it enables better disposition of the fuse link to be made.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States, is:

1. In a cartridge fuse of the ferrule type, an insulating casing, cover plates hinged to the ends of the casing, the pivot pin being an integral part of the cover plate and offset angularly from the plane of the cover plate, and the cover plate being provided with a straight edge over which a flat fusible link is adapted to be folded, and a ferrule at the end of the casing for pressing the folded end of the fuse link into contact with the cover plate.

2. In a cartridge fuse of the ferrule type, an insulating casing, a liner disposed interiorly of the casing and projecting at the end thereof, a cap secured exteriorly of the casing and provided with an inwardly extending flange constituting with the liner and the end of the casing a circular recess, a pivoted cover plate having journals engaged in the said recess, the said cover plate having a straight edge over which a flat fusible link is adapted to be folded, and a ferrule at the end of the casing for pressing the folded end of the fuse link into contact with the cover plate.

3. In a cartridge fuse of the ferrule type, an insulating casing, a liner disposed interiorly of the casing and projecting at the end thereof, a cap secured exteriorly of the casing and provided with an inwardly extending flange constituting with the liner and the end of the casing a circular recess, the outer ends of the liner and the cap being provided with registering radial notches leading to the said circular recess, a pivoted cover plate having offset journals engaged in the said recess and a connecting tongue adapted to be moved in the said notches, the cover plate having a straight edge over which the end of a fusible link is adapted to be folded, and a ferrule at the end of the casing for pressing the folded end of the fuse link into contact with the cover plate.

4. In a cartridge fuse of the ferrule type, an insulating casing, a sleeve liner in the

end of the casing and a cap exteriorly of the casing, and a hinged cover plate; the said cap being provided with an enlarged axial opening to facilitate insertion of the fuse
5 elements into the casing, and a ferrule holding the cover plate in closed relation to the said opening, whereby one end of the link is clamped upon the cover plate.

10 In testimony whereof I have signed my name at Milwaukee, this 20th day of January, 1930.

WM. T. CLARK.

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